OIPE JC100
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PATENT & TRADEMARK OFFICE

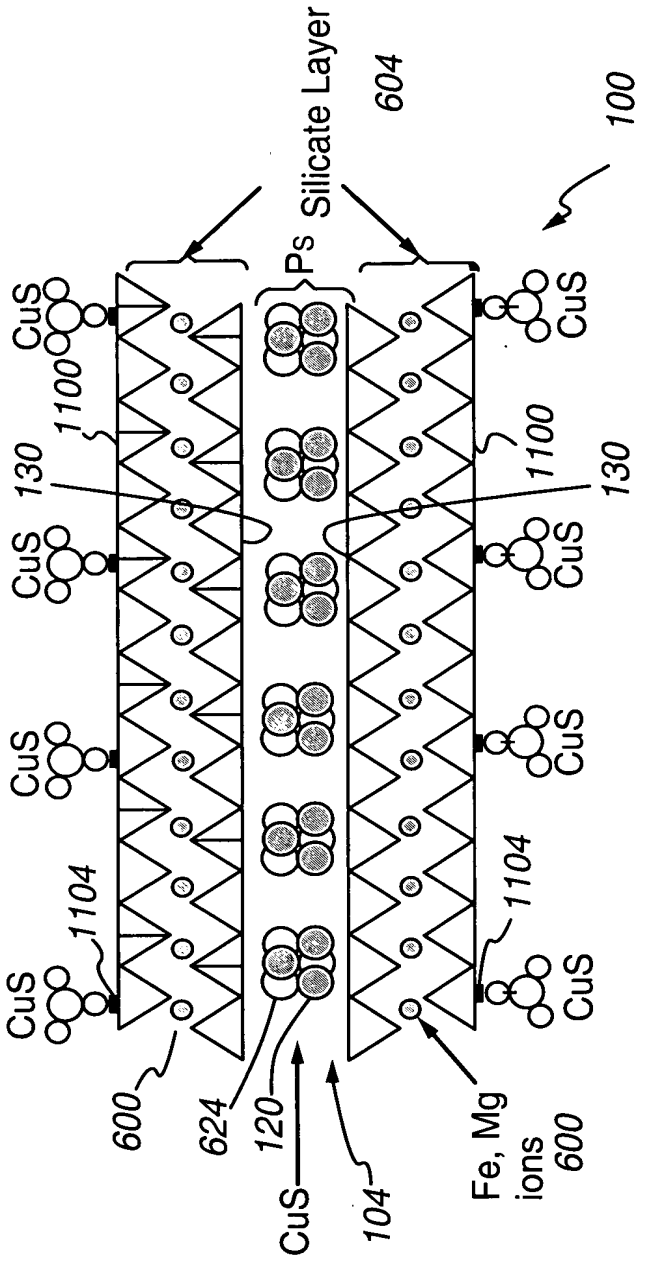

Fig. 1

Final Amendment of Vermiclite

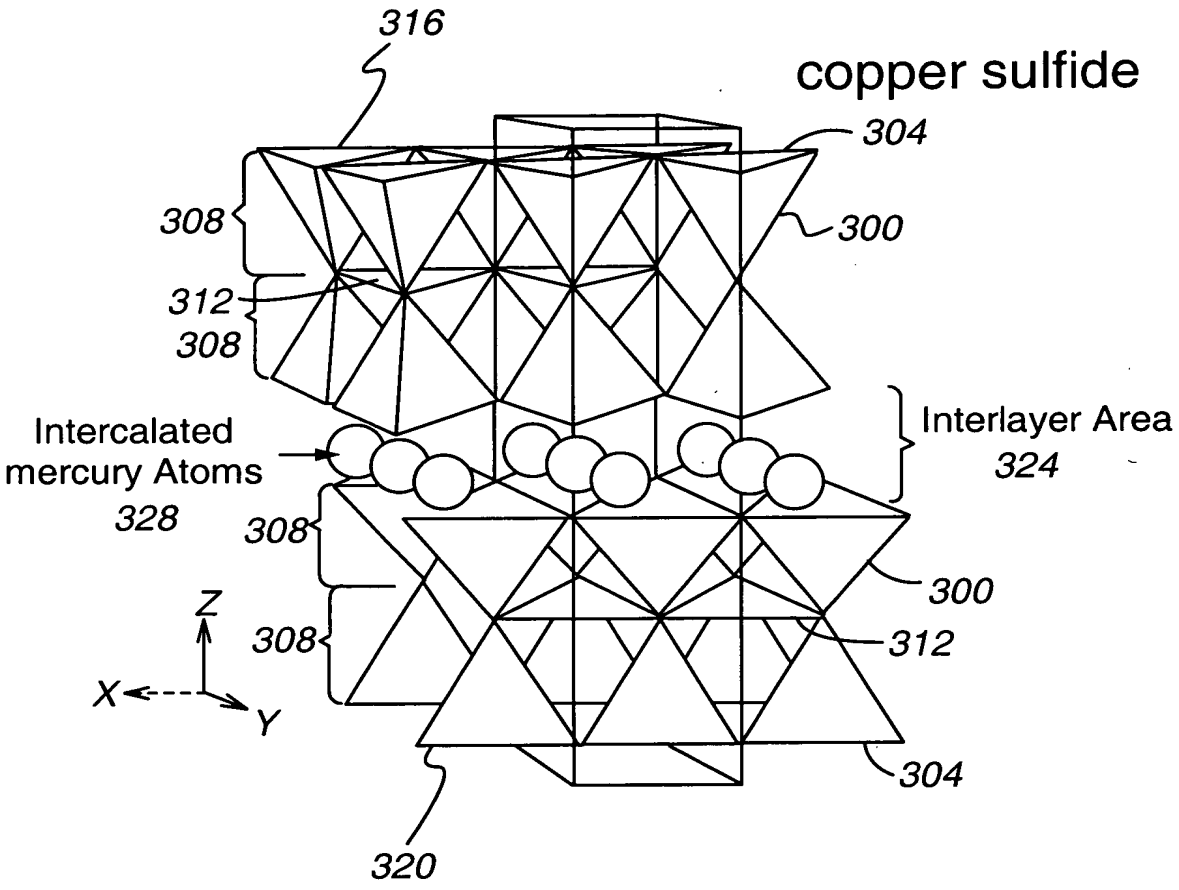
316
copper sulfide
304
308
300
312
308
Intercalated
mercury Atoms
328
Interlayer Area
324
308
300
Z
308
312
X
Y
304
320

Fig. 2

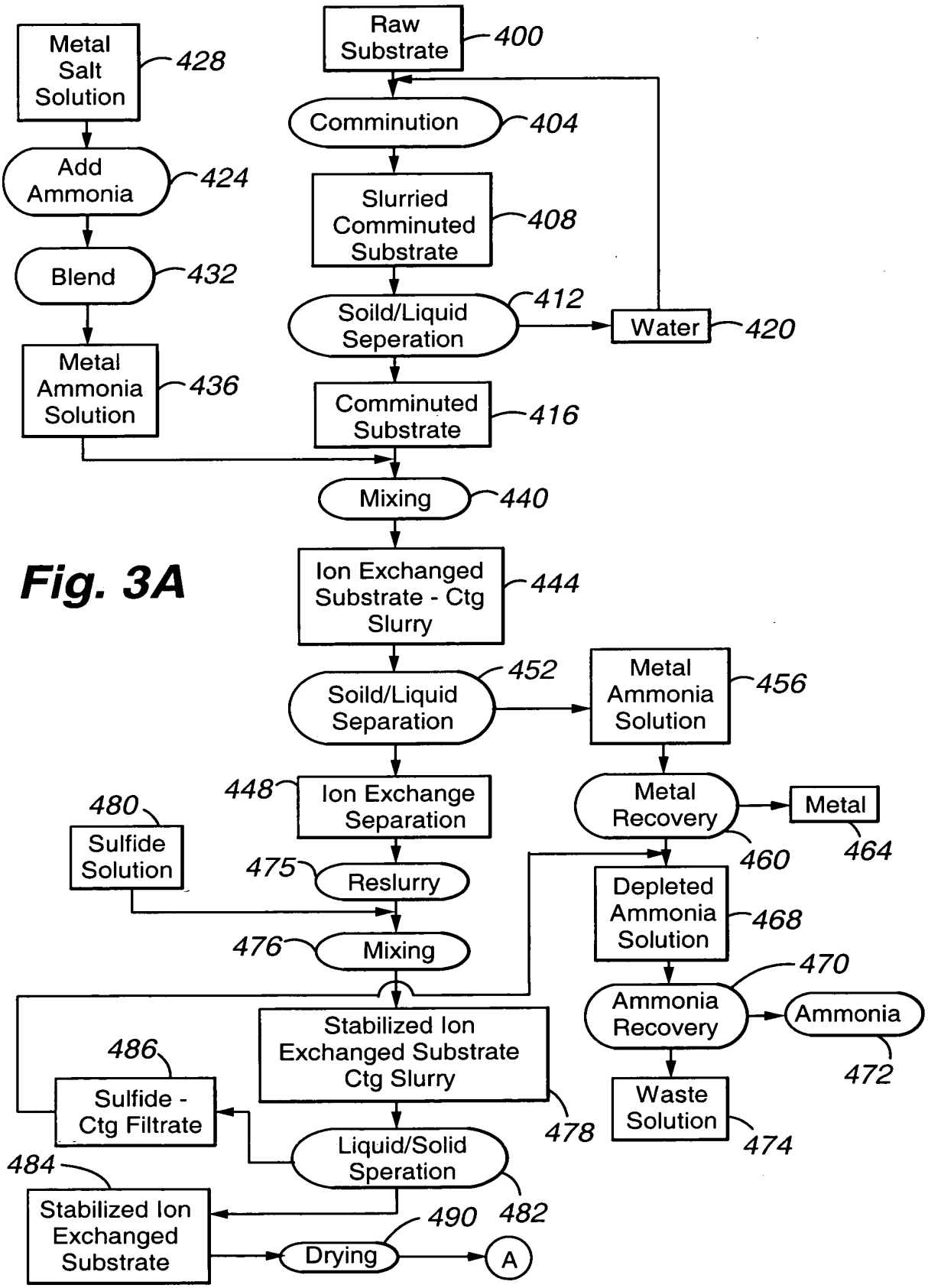
Raw Substrate
400
Metal Salt Solution
428
Comminution
404
Add Ammonia
424
Slurried Comminuted Substrate
408
Blend
432
Soild/Liquid Seperation
412
Water
420
Metal Ammonia Solution
436
Comminuted Substrate
416
Mixing
440
Ion Exchanged Substrate - Ctg Slurry
444
Soild/Liquid Separation
452
Metal Ammonia Solution
456
448
Ion Exchange Separation
Metal Recovery
Metal
464
480
Sulfide Solution
475
Reslurry
460
Depleted Ammonia Solution
468
476
Mixing
470
Ammonia Recovery
Ammonia
472
Stabilized Ion Exchanged Substrate Ctg Slurry
478
486
Sulfide - Ctg Filtrate
Waste Solution
474
Liquid/Solid Speration
482
484
Stabilized Ion Exchanged Substrate
490
Drying
A

Fig. 3A

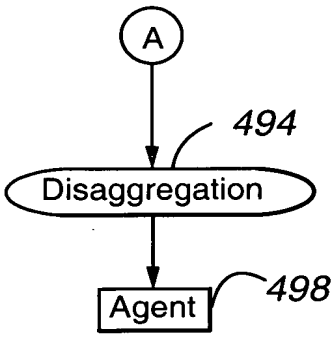

Fig. 3B

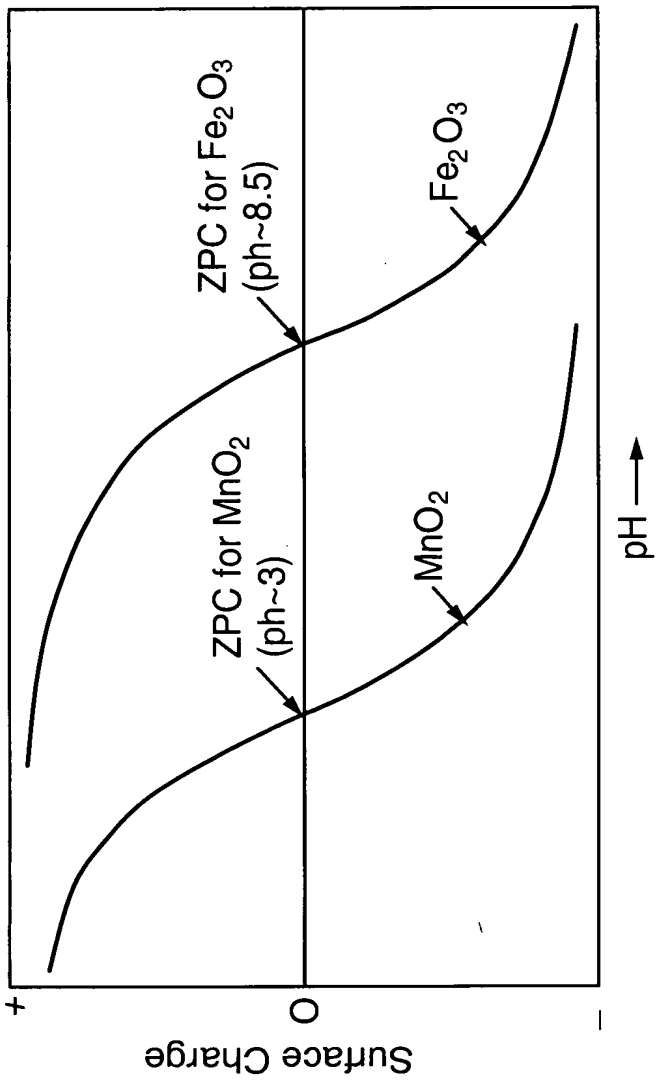
ZPC for Fe_2O_3 (ph~8.5)
Fe_2O_3
ZPC for MnO_2 (ph~3)
MnO_2
pH
+
O
-
Surface Charge

Fig. 4

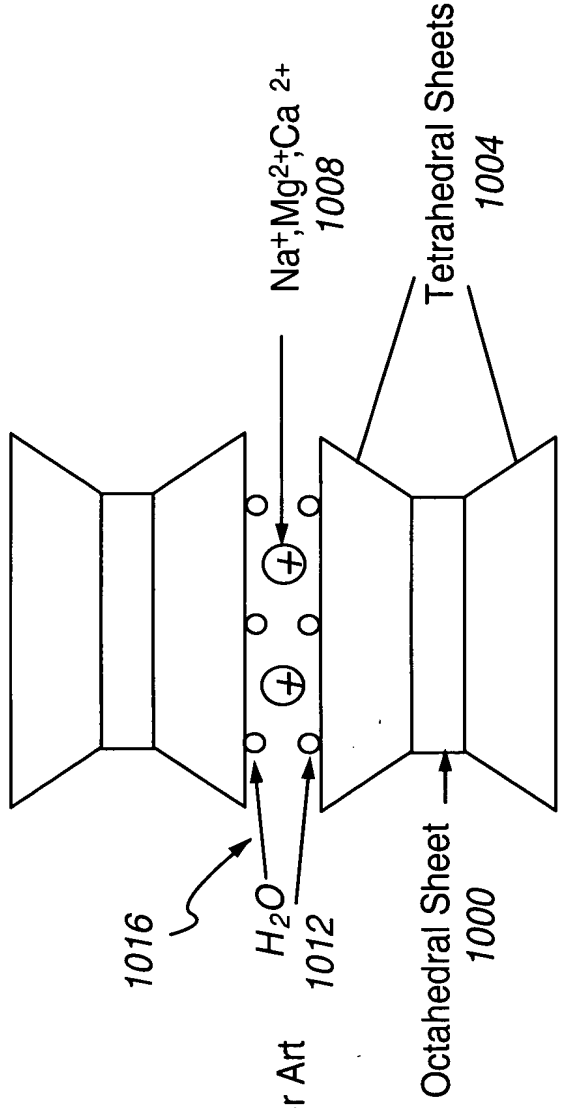

Fig. 9 Prior Art

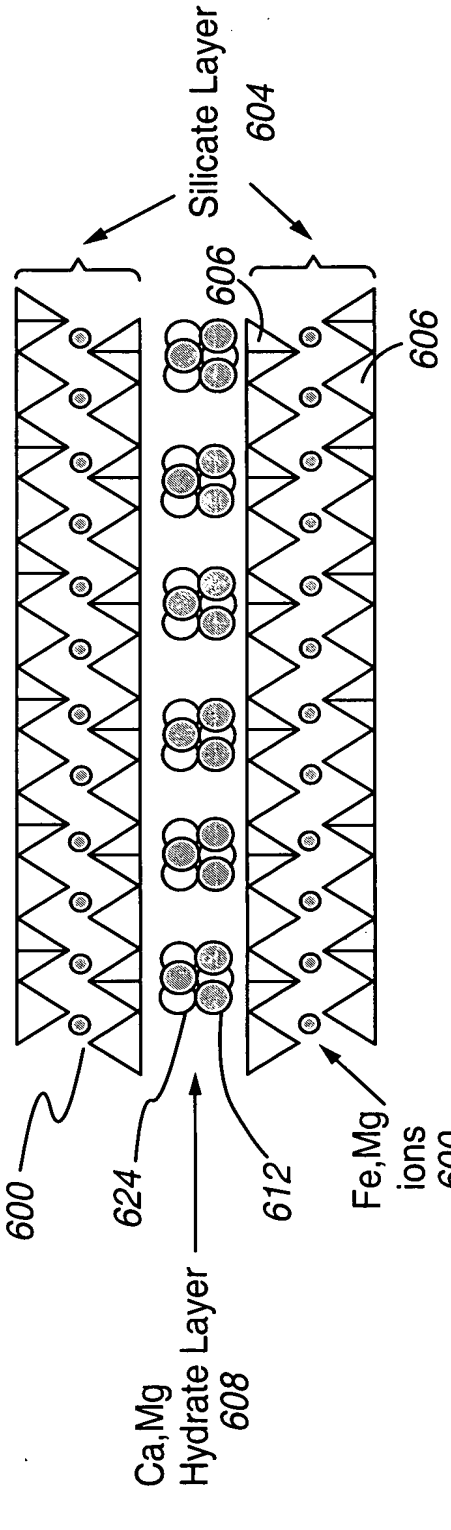

Fig. 5 Prior Art

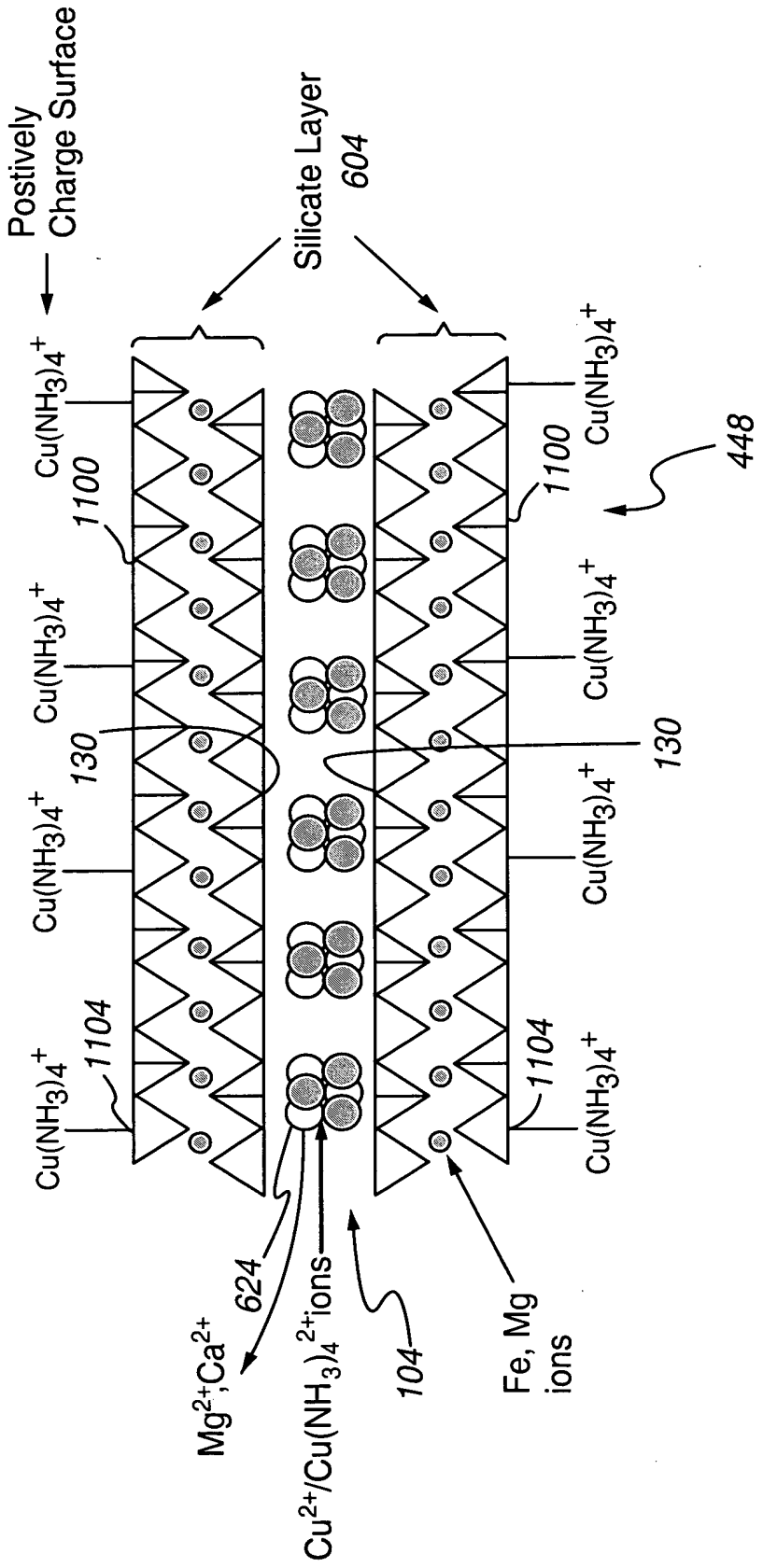
Postively Charge Surface
Silicate Layer
604
$Cu(NH_3)_4^+$
1100
448
130
1104
624
$Mg^{2+};Ca^{2+}$
$Cu^{2+}/Cu(NH_3)_4^{2+}$ ions
104
Fe, Mg ions

Fig 6

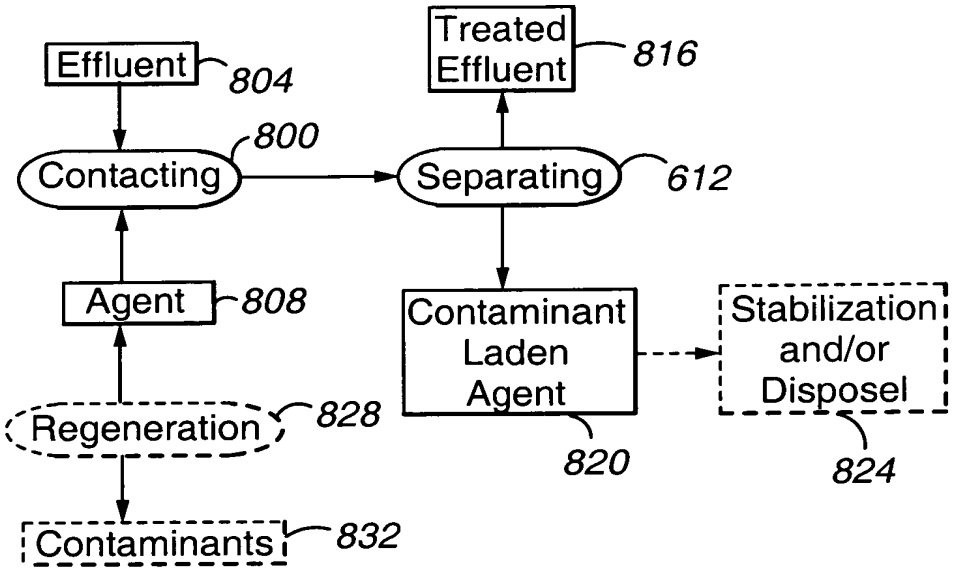
Effluent
804
Treated Effluent
816
800
Contacting
Separating
612
Agent
808
Contaminant Laden Agent
820
Stabilization and/or Disposel
824
Regeneration
828
Contaminants
832

Fig. 7

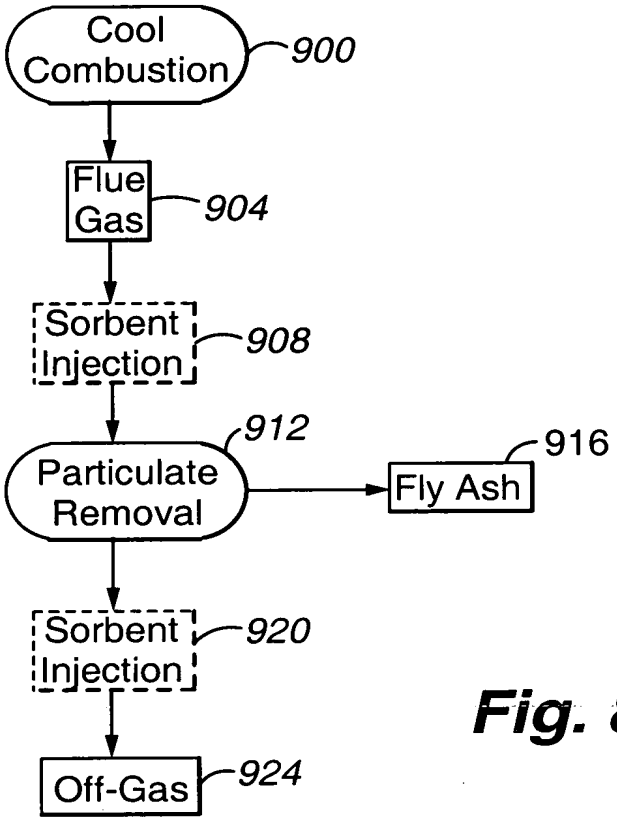
Cool Combustion
900
Flue Gas
904
Sorbent Injection
908
912
Particulate Removal
916
Fly Ash
Sorbent Injection
920
Off-Gas
924

Fig. 8

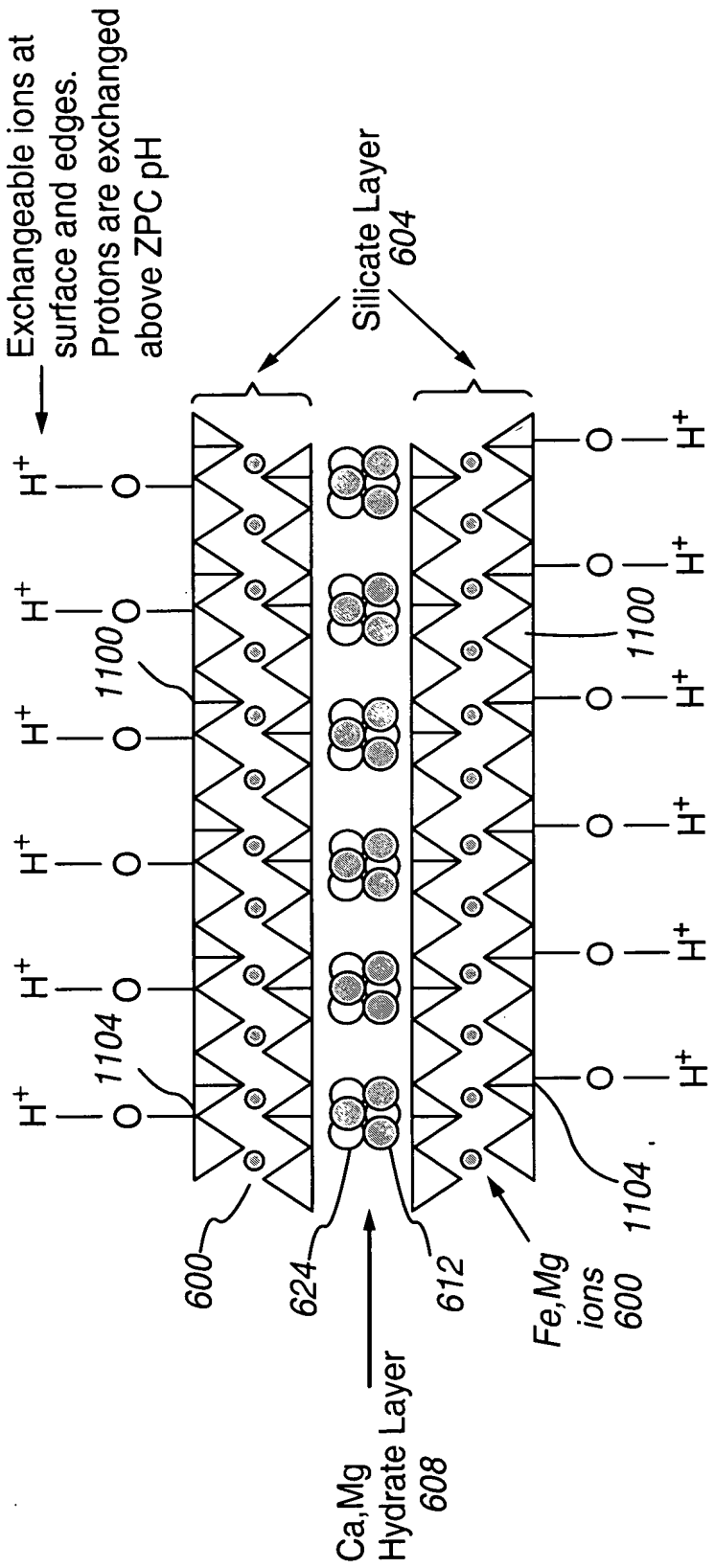

Fig. 10 Prior Art